



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,293	07/20/2001	Ali Kheymehdooz	Q01-1021-US1	1710
32093	7590	01/10/2006	EXAMINER	
HANSRA PATENT SERVICES 4525 GLEN MEADOWS PLACE BELLINGHAM, WA 98226			SNIEZEK, ANDREW L	
			ART UNIT	PAPER NUMBER
			2651	

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/910,293

Applicant(s)

KHEymeHDOOZ, ALI

Examiner

Andrew L. Sniezek

Art Unit

2651

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-11,16,18,20-27,29,33-35 and 38-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 43 is/are allowed.
- 6) ☐ Claim(s) 1,3,4,6-11,16,18,20,25-27,29,33-35,38-42,44-46,48,49,51 and 52 is/are rejected.
- 7) ☒ Claim(s) 21-24,47 and 50 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/19/05 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 sets forth "the Proportional-Integral control technique" which lacks positive antecedent basis.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2651

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 33-35 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Rowan et al. (5,963,393).

Rowan et al. teaches a disk drive (figures 1 and 2) including an actuator assembly (104), driver circuit (115), sense resistor (204), first operational amplifier (208), second operational amplifier (206) and a multiplexer (216) whereby the V_{bemf} is determined based on the amplified voltage across the VCM and the sense resistor which satisfies the limitations of claim 33.

Re claims 34 and 35: microprocessor is satisfied combination of controller (114) and estimator (116), which are used to calculate and form signals sent to the driver circuit.

Re claim 38: Note column 6, lines 43-55 in which analog-to-digital converters can be used.

6. Claims 1, 27 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Harmer (US 20020196577A1).

Harmer teaches a method of measuring/controlling the velocity of a head during ramp loading/unloading (see abstract and figure 5) which includes measuring voltage across VCM and a sense resistor in series that are calibrated at power-up (see figure 6 depicting actuator (VCM) sensing by OA1 and R_{sense} by OA2 along with discussion of figure 7), calculating the back emf and adjusting the velocity of the head, (see figure 5 along with paragraph [0035] which satisfies the limitations of claims 1 and 27.

Re claim 29: Note feedback arrangement depicted in figure 6.

7. Claims 16, 20, 25, 26, 44-46, 48, 49 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Carobolante et al.(US006081112A).

Re claims 16 and 20: Carobolante et al. teaches a method and corresponding apparatus that sets a target velocity (22, figure 1), measures voltages across a VCM and sense resistor through separate voltage paths (figure 2), calculates velocity error (Verror, figure 1) and adjusts the velocity of a head (column 2, lines 20-34).

Re claims 44 and 48: These claims although written using slightly different language are deemed satisfied by Carobolante et al. for reasons given with respect to claims 16 and 20.

Re claim 45: Note for example column 1, lines 40-53 in which a head is moved to a parked location (stopped position) which must apply proper voltage/current.

Re claims 46 and 49: The claimed calibration constant is deemed satisfied by the impedance value obtained by calibration (column 2, lines 8-20).

Re claims 25 and 26: The disabling of the VCM and stopping of the head are deemed satisfied by the arrangement discussed in which the heads are loaded onto a ramp and then stopped in the parked location.

Re claim 51: Note modified arrangement of figures 3 and 4 (switch 46) satisfying the claimed discrete –time calculations

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2651

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rowan et al. (5,963,393).

The teachings of Rowan et al. (5,963,393) are discussed above and incorporated herein. Rowan et al. (5,963,393) does not teach the specifics of the analog-to-digital converter as set forth in claims 39-41, i.e. 12 bits, 5 volts and a resolution of 1 mv/count. These features are deemed to amount to routine engineering in which one of ordinary skill in the could have obviously obtained without departing from an arrangement that obtains a greater or lesser degree of accuracy or resolution which would therefore increase or decrease the computational burden of the arrangement.

10. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rowan et al. (5,963,393) in view of applicants admitted prior art.

The teaching of Rowan et al. (5,963,393) is discussed above and incorporated herein. Rowan et al. (5,963,393) does not teach the specific techniques of calculating back emf voltage including a PWM technique and an IR technique. It is well known that back emf voltages can be calculated using these techniques as taught by applicants admitted prior art discussed on page 4 of the specification as alternative methods. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate either a PWM technique or an IR technique as taught by applicants admitted prior art

Art Unit: 2651

into the arrangement of Rowan et al. (5,963,393) as alternatives to achieve the same result.

11. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harmer in view of applicants admitted prior art.

The teaching of Harmer is discussed above and incorporated herein. Harmer does not teach the specific techniques of calculating back emf voltage including a PWM technique and an IR technique. It is well known that back emf voltages can be calculated using these techniques as taught by applicants admitted prior art discussed on page 4 of the specification as alternative methods. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate either a PWM technique or an IR technique as taught by applicants admitted prior art into the arrangement of Harmer as alternatives to achieve the same result.

12. Claims 6, 10, 11 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harmer in view of Kawachi (US006643088B1)

The teaching of Harmer is discussed above and incorporated herein. The use of a microprocessor (claims 6 and 10), although not specifically taught by Harmer is well known in the art as taught by Kawachi in column 2, lines 45-46. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a microprocessor as taught by Kawachi into the arrangement of Harmer to provide an alternative to actuator speed control. Clearly the feed back loops of Harmer and Kawachi operate in a continuous manner therefor satisfying the real time feature of claim 11.

Re claim 52: Note figures 4-7 and corresponding disclosure of Kawachi. Column 9 indicates that CPU uses digital inputs for processing information this processing takes place in by the use of controller (101), speed controller (41), both of which are realized by control program processing of CPU (32), column 10, lines 16-28; column 9, lines 48-53. Since the operation of the arrangement of Kawachi et al. is digital, calculations must be in discrete times as claimed. It is noted that applicant's own disclosure Page 12 indicates that a microprocessor that digitally processes control signals needs a velocity compensation that implemented in a discrete time domain. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate such teaching into the arrangement of Harmer to provide an alternative to actuator speed control.

13. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harmer and Kawachi as applied to claims 6, 10, 1 and 52 above, and further in view of applicants admitted prior art.

The teaching of Harmer and Kawachi is discussed above and incorporated herein. Harmer and Kawachi do not specifically teach the specific techniques used to calculate back emf voltages as set forth in claims 7-9. It is well known that back emf voltages can be calculated using these techniques as taught by applicants admitted prior art discussed on page 4 of the specification as alternative methods. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate either a PWM technique or an IR technique as taught by applicants admitted prior art into the arrangement of Harmer and Kawachi as applied as alternatives to achieve the same result.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carobolante et al. in view of Kawachi (US006643088B1).

The teaching of Carobolante et al. is discussed above and incorporated herein.

Although Carobolante et al. does not teach the use of a Proportional-Integral control technique, such is well known in the art as taught by Kawachi, column 10, lines 20-21 as one manner in which VCM control is performed. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of Kawachi into the arrangement of Carobolante et al. for VCM control.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US006867944B1, US006204629B1 and US006463211B1 are cite showing various features related to the claimed invention.

Allowable Subject Matter

16. Claims 21-24 and 47, 50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. Claim 43 is allowed.

18. The following is a statement of reasons for the indication of allowable subject matter: The claimed method as set forth by the combination of limitations in claim 21/20/16 that uses a velocity error signal to calculate a control variable, the value calculated being sent to the drive is neither taught by nor an obvious variation of the art of record. Claims 22-24 depend on claim 21 either directly or indirectly. The claimed

Art Unit: 2651

method as set forth by the combination of limitations in claims 47/46/44 and 50/49/48 including each of the steps or comparing for the calculation of the calibration constant is neither taught by nor an obvious variation of the art of record. The claimed method as set forth in claim 43 in which a back emf voltage is calculated to adjust the velocity of a transducer during a ramp load/unload by using either a PWM technique or an IR cancellation technique, wherein both techniques are available for calculating the back emf voltage without implementing two distinct sets of hardware is neither taught by nor an obvious variation of the art of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew L. Sniezek whose telephone number is 571-272-7563. The examiner can normally be reached on Mon.-Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

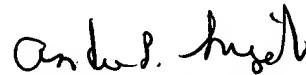
Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

Art Unit: 2651

For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Andrew L. Sniezek
Primary Examiner
Art Unit 2651

A.L.S.
1/9/05